

Aquarius Status Report

SMAP Cal/Val Workshop

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Aquarius/SAC-D

First Year Data: Aug 25, 2011 - Aug 25, 2012

Milestones

- Coming Events

- Version 2.0

- January, 2013
- Incorporates collective changes from year 1 (e.g. drift correction; pointing angle; antenna pattern, land mask, roughness correction; updated RFI filter)

- Aquarius Soil Moisture Product

- Code implemented : SMAP algorithm
- USDA (Jackson/Bindlish)

- AGU

- OS11H, OS12C and OS21E: Aquarius and SMOS Salinity Science
- OS13E: Ocean Surface Emissivity
- C14A: Remote Sensing of Cryosphere III

- SMOS-Aquarius Joint Workshop

- April 15-17, IFREMER, Brest, France

- Status

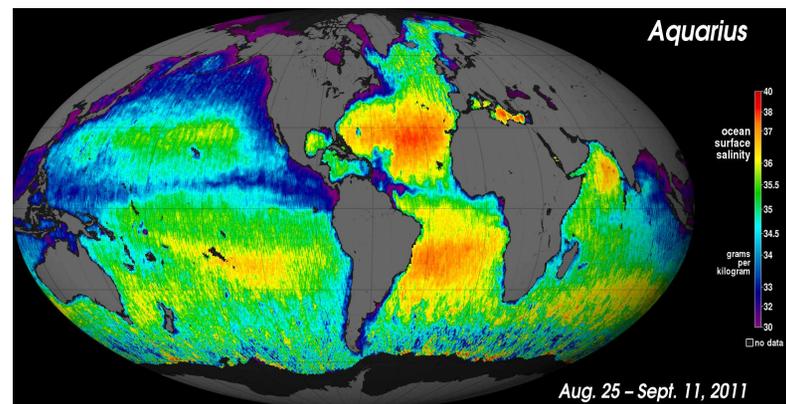
- Aquarius working well

- Minor Issues

- Radiometer gain drift
- Ascending/descending bias

- Spacecraft

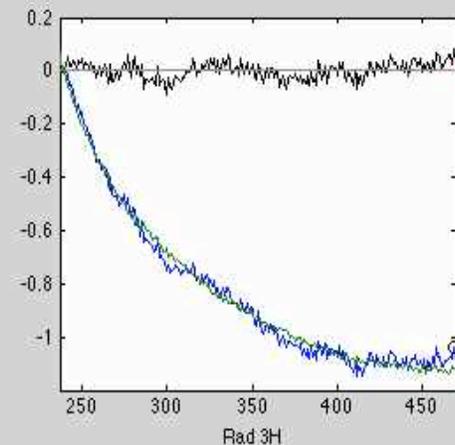
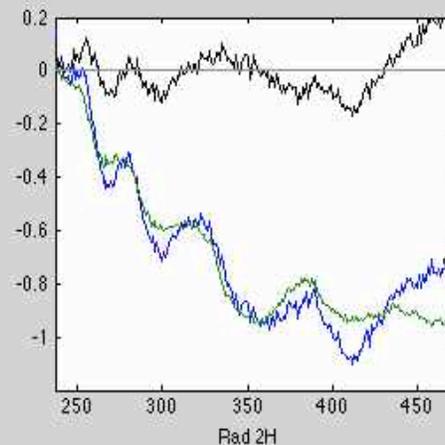
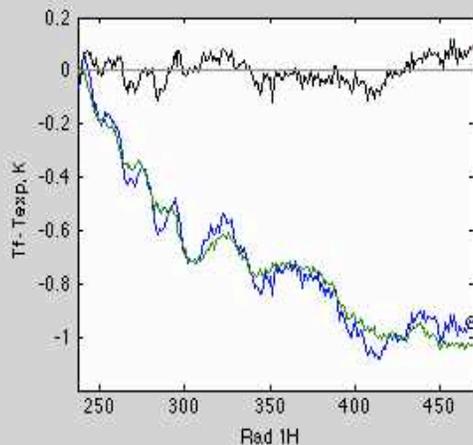
- Star tracker anomalies



Top: Launch, June 10, 2011; Bottom: Aquarius first release image

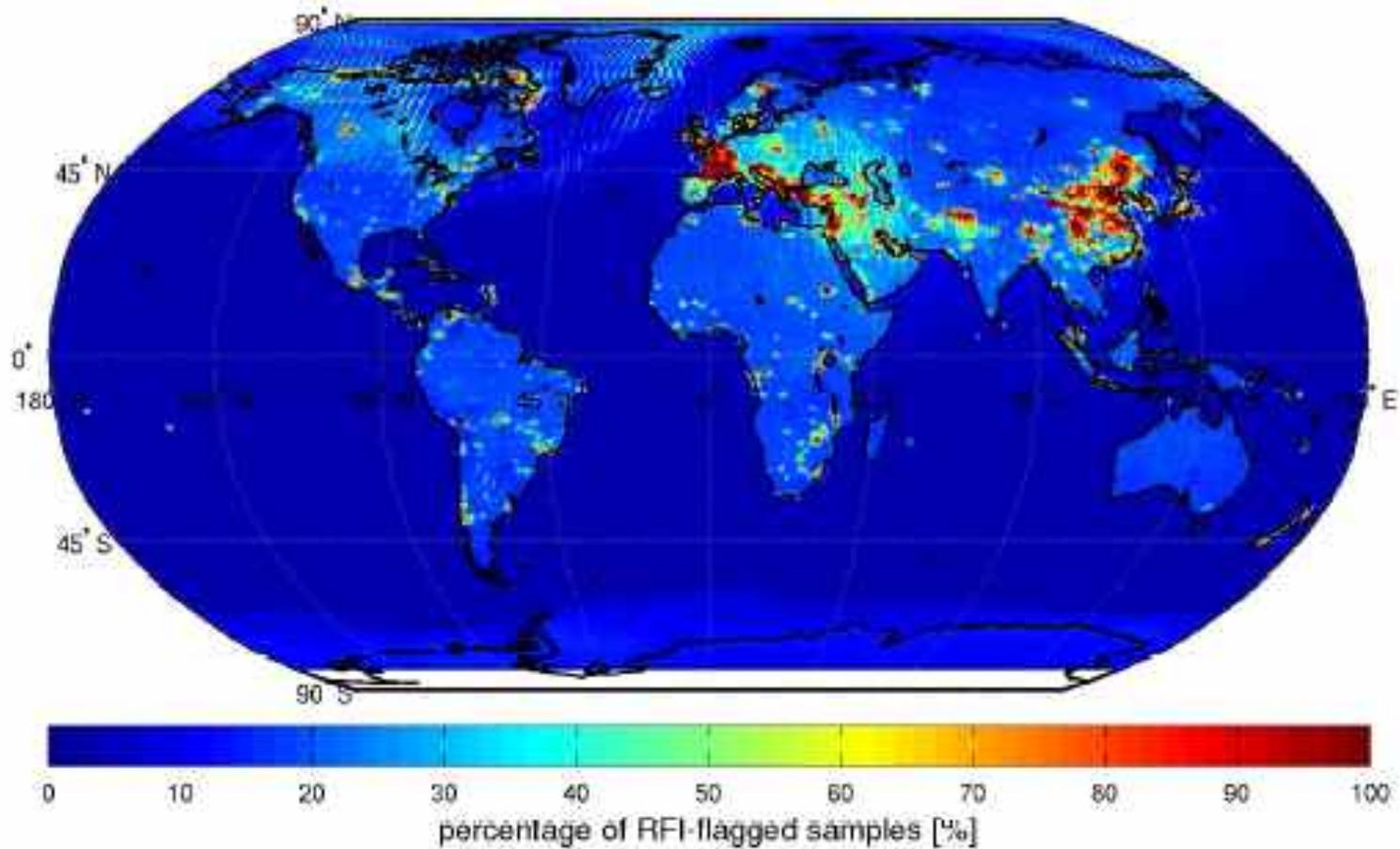
Gain Drift: Two Components

- Exponential change
 - Probably due to out-gassing
 - Corrected by fitting exponential to data (V1.3.5)
- Residual (wiggles)
 - Uncertain origin
 - Recent evidence suggests hardware (in the radiometer)



Aquarius RFI

August 25, 2011 - August 29, 2012
V- and H-polarization, all orbits

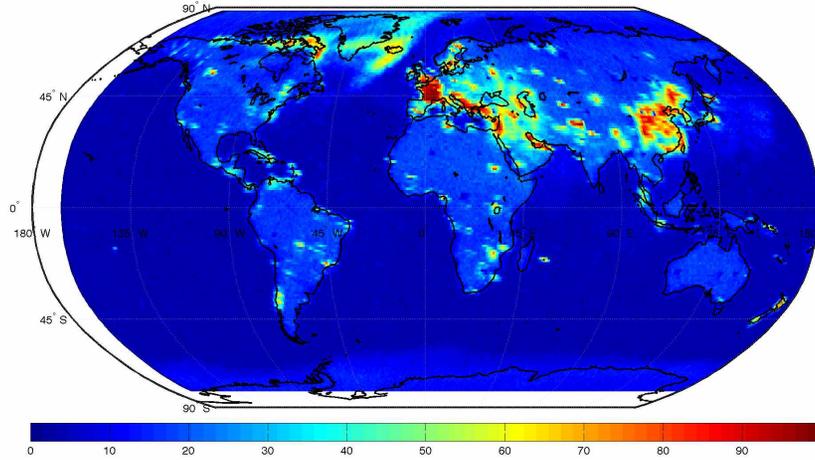


Aquarius RFI

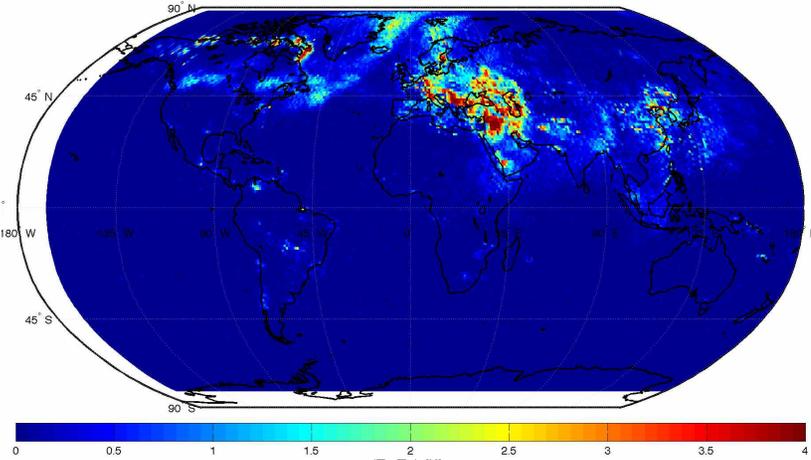
Frequency (%)

Amplitude (K)

beam 2, H-polarization
descending orbits only

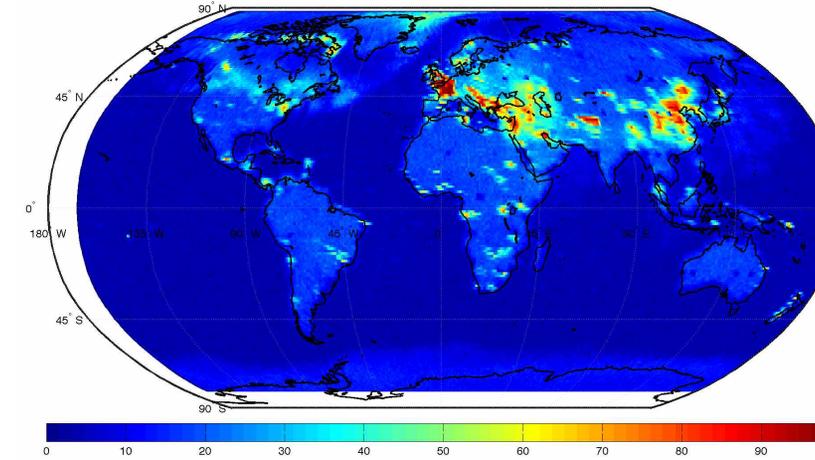


beam 2, H-polarization
descending orbits only

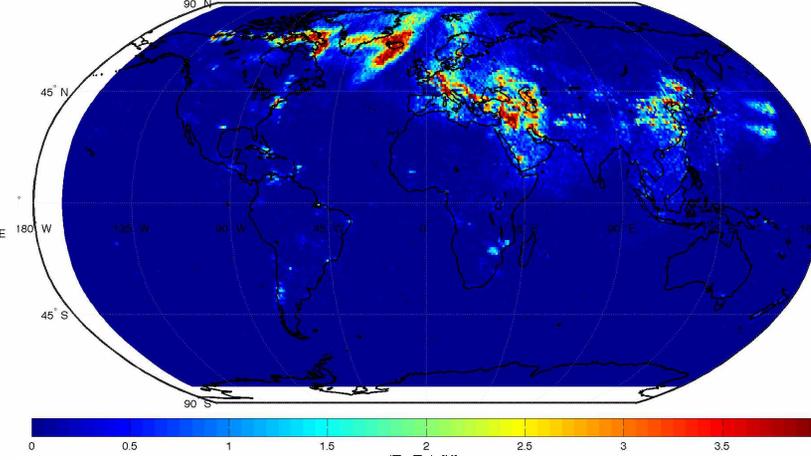


H-Pol

beam 2, V-polarization
descending orbits only



beam 2, V-polarization
descending orbits only

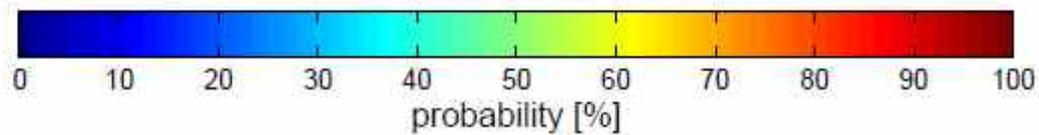
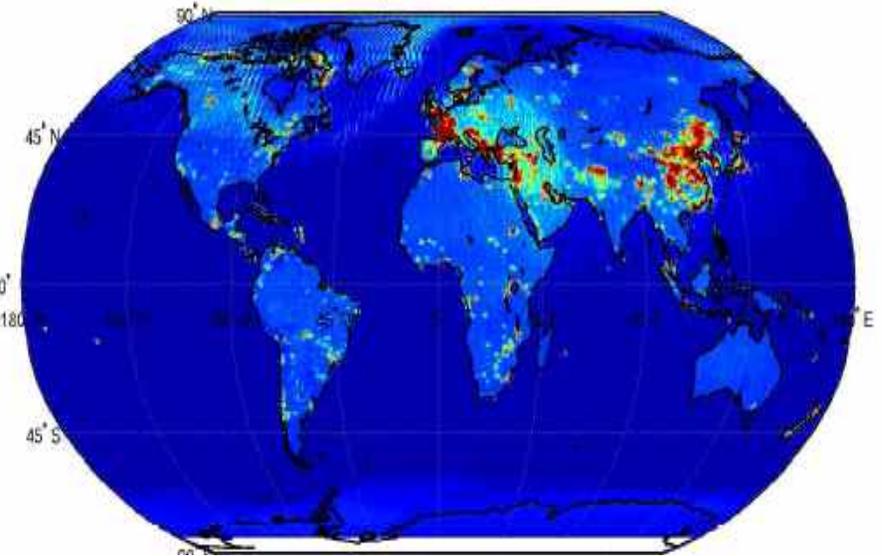
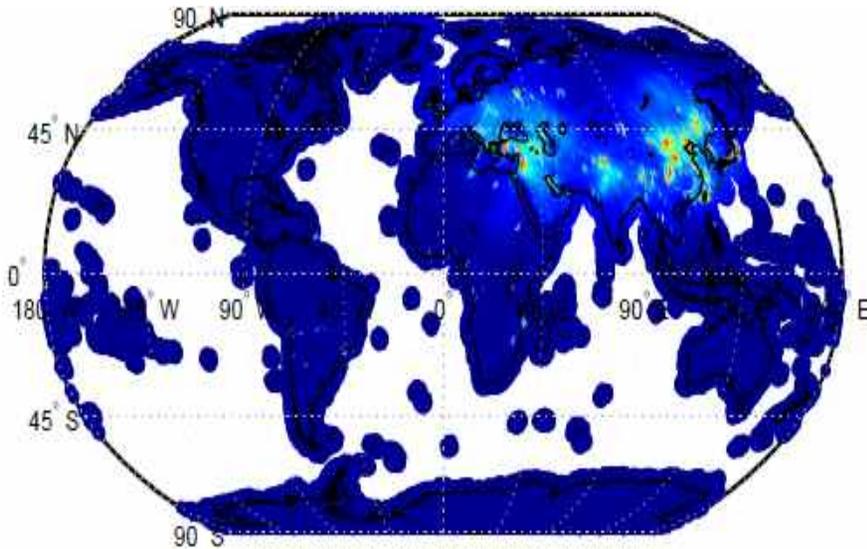


V-Pol

SMOS and Aquarius RFI Frequency (%)

SMOS: One Year
Ascending + Descending

Aquarius: One Year
Ascending + descending



Lessons Learned

- Practice:
 - Simulated mission
 - Used to test ground processing/data links
 - Simulate data
 - Test data acquisition (data formats)
 - Test science algorithms
- Have a Good Simulator
 - Prelaunch:
 - Simulated data for testing
 - Predicted behavior (e.g. effects of antenna on T3)
 - Post-launch:
 - Reference for evaluating instrument performance
 - Reference for calibration
- Other
 - 12 months for validation is marginal
 - Seasonal cycle
 - Big antennas in space => uncertain antenna patterns
 - Issues for calibration

The End